

AMENDMENTS TO THE CLAIMS

1. (Previously Presented) A method for automatic adjustment of the color of a digital original image for forming a digital adjusted image, the original image being a whole of a supplied digital image or a portion thereof and being formed of a plurality of color dots, each dot having at least three independent values representing the strength of the three primary colors R, G, and B, each strength value lying between a minimum and a maximum of a dynamic range, comprising:

determining an original dot maximum of the R, G, or B strength values in RGB color space for each color dot within the original image for establishing an original histogram of original dot maximums for the plurality of color dots within the original image;

establishing an original average strength of the original histogram;

amplifying each of the original dot maximums by selecting a correcting scaling factor from a continuous scaling function and applying the correcting scaling factor for each original dot maximum which scales the original dot maximum to a scaled dot maximum which is less than or equal to the maximum of the dynamic range;

establishing a corrected average strength of the original dot maximums from a corrected histogram of the scaled dot maximums;

comparing the original average strength to a target average strength;

determining an interpolation constant between an identity scaling factor of 1 and the correcting scaling factor for each original dot maximum by interpolation using the target average strength, the corrected average strength and the original average strength for each dot maximum; and

creating an adjusted image without color distortion by applying the interpolation constant to modify the correcting scaling factor for each original dot maximum and establishing a target scaling factor which is applied to each color dot's R, G and B strength values so that a histogram of the adjusted image has the target average strength and that the

ratios of the strength values between R, G and B for the color dot remain the same after scaling as they were before scaling.

2. (Original) The method of claim 1 wherein the scaling function is non-linear and continuous.

3. (Original) The method of claim 1 wherein the supplied image is corrected prior to adjustment of the color of the digital original image for forming the digital adjusted image further comprising:

establishing a supplied histogram of R, G, or B strength values for each color dot within the supplied image;

determining a offset strength value between the minimum of the dynamic range of the system and a minimum threshold strength value of the supplied histogram;

subtracting the offset strength value from each R, G, and B value for forming the original image for automatic correction thereof.

4. (Original) The method of claim 3 wherein minimum threshold strength value of the supplied dot minimums is the minimum strength for a majority of the color dots.

5. (Original) The method of claim 4 wherein the majority of the color dots is between 99 % and 100% of the color dots.

6. (Original) The method of claim 5 wherein the majority of the color dots is between 99.5 and 99.9 % of the color dots.

7. (Original) The method of claim 1 where the target average strength is selected empirically.

8. (Original) The method of claim 7 where the target average strength is between 50 and 65 % of the dynamic range.

9. (Original) The method of claim 8 where the target average strength is about 58% of the dynamic range.

10. (Original) The method of claim 1 where the continuous scaling function is a polynomial function.

11. (Currently Amended) The method of claim 1 where the continuous scaling function has a form $f(x) = a + 10^{bx}$ and $DR_{min} \leq x < x_0$, where DR_{min} is the minimum of the dynamic range and $f(0) = 0$ and x_0 is an anchor strength value intermediate the minimum and the maximum of the dynamic range and $f(x_0) = x_0$;

wherein a and b are ~~constant~~ constants; and

x is a dot maximum strength value.

12. (Original) The method of claim 11 where the continuous scaling function has a form $f(x) = a + \log_{10}(bx)$ and $x_0 \leq x < DR_{max}$, between the anchor strength value x_0 DR_{max} is the maximum of the dynamic range where $f(x_0) = x_0$ and $f(DR_{max}) = DR_{max}$.

13. (Original) The method of claim 1 wherein the interpolation constant is determined as follows:

$$\%CORR = \frac{(STR_{TARGET} - STR_{ORIGINAL})}{(STR_{CORRECTED} - STR_{ORIGINAL})} \times 100$$

where

STR_{TARGET} is the pre-determined target average strength value,

$STR_{ORIGINAL}$ is the original average strength value,

$STR_{CORRECTED}$ is the corrected average strength value, and

% CORR is the interpolation constant expressed as a percentage that the target scaling factor is between the corrected scaling factor and the identity scaling factor.

14. (Original) The method of claim 13 wherein the target scaling factor for each original dot maximum is determined as follows:

$$TSF = \frac{(\%CORR * (DotMax_{CORRECTED} - DotMax_{ORIGINAL}) + DotMax_{ORIGINAL})}{(100 * DotMax_{ORIGINAL})}$$

where:

$DotMax_{CORRECTED}$ represents the corrected dot maximum;

$DotMax_{ORIGINAL}$ represents the original dot maximum;

15. (Original) The method of claim 13 wherein

if % CORR > 80%, then % CORR = 80%;

if 0% < % CORR < 80%, then % CORR = % CORR; and

if % CORR < 0%, then % CORR = 0%.

16. (Original) A method for automatic adjustment of the color of a digital image or a portion thereof, the image being formed of a plurality of color dots, each dot having at least three independent values representing the strength of the three primary colors R, G, and B, each strength value lying between a minimum and a maximum of a dynamic range, comprising:

establishing an original histogram of dot maximums for the plurality of color dots within the original image and an original average strength thereof;

amplifying each dot maximum with a scaling factor selected from a continuous scaling function to obtain a scaled dot maximum which is less than or equal to the maximum of the dynamic range;

establishing a corrected histogram of scaled dot maximums and a corrected average strength thereof;

interpolating a target scaling factor from a target average strength, the corrected average strength and the original average strength for each dot maximum; and

creating the adjusted image without color distortion by applying the target scaling factors to each color dot's R, G and B strength values so that a histogram of the adjusted

image has the target average strength and that the ratios of the strength values between R, G and B for the color dot remain the same after scaling as they were before scaling.

17. (Original) The method of claim 16 wherein the image is corrected prior to adjustment of the color further comprising:

establishing a supplied histogram of R, G, or B strength values for each color dot within the supplied image;

determining a offset strength value between the minimum of the dynamic range of the system and a minimum threshold strength value of the supplied histogram; and

subtracting the offset strength value from each R, G, and B value for forming the original image for automatic correction thereof.